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ABSTRACT

There are two facets to the lyric rhythm of Taiwanese folk songs: beat alignment and metrical pattern selection. Because the lyrics are metrically derived from classical Chinese verse, a prosodic line may have syllable-beat symmetry. However, syllable-beat mismatches are also common. Lexical syllables have preference over functor syllables in beat alignment in such mismatches. Analysis of folk songs in Taiwanese reinforce the assumption that the prominence of lexical over functor syllables is pan-dialectal in Chinese. In these lyrics, beat alignment and metric pattern selection (metricality) can be seen as a result of matching phonological and syntactic constituents. The way in which syllables and beats are aligned yields the lyric rhythm. A set of well-formedness principles governs the process of beat alignment. These principles rely on two major syntactic factors: the categorical distinction between lexical and functor syllables and the hierarchy of immediate constituents. The rhythm principles also effectively filter out metrical patterns that would result in improper beat alignment. A 56-item bibliography is included. (MSE)

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THE SYNTAX-PHONOLOGY INTERFACE AS THE KEY TO METRICALITY: Evidence from Taiwanese Folk Songs

Yuchau E. Hsiao

Abstract: Based on evidence from the lyrics of Taiwanese folk songs, this paper shows how metricality is keyed to interrelations between syntax and phonology. The lyrics are shown to allow mismatches between beats and syllables, and the way that syllables and beats are aligned yields the lyric rhythm. A set of well-formedness principles (Rhythm Principles) is proposed to govern the process of beat alignment. These principles rely on two major syntactic factors: the categorial distinction between lexical and functor syllables and the hierarchy of immediate constituents. The Rhythm Principles also effectively filter out metrical patterns that would result in improper beat alignment.

A recent linguistics topic that has attracted enormous interest is the nature of the relationshipy between syntax and phonology. Kaisse (1985), Odden (1987), Chen (1987,1989,1990), Hsiao (1990c,d,1991c), and others have shown that many phonological processes in English and Chinese rely crucially on direct syntactic conditions. Other phenomena have been explained using models in which the phonology-syntax interface is mediated by prosodic structures of various sorts (cf. Selkirk 1984,1986; Nespor & Vogel 1986; Shih 1986; Hong 1987; Zec 1988; Inkelas 1989; Hayes 1989; Hsiao 1990a,d,1991a).

Poetry (particularly in Chinese and English) is one domain that has provided significant insights into the question of which phonological processes are sensitive to which syntactic factors (cf. Chen 1980,1984a,b,c; Wright 1983; Youmans 1983,1989; Hsiao 1984,1990a). In this study, I confront various issues concerning the interaction of phonology and syntax from a fresh perspective, based on an analysis of the lyrics of Taiwanese folk songs, a type of language which is not as rigidly structured as poetry, yet not as variable as ordinary speech.[1] The folk song lyrics, recited in every street and alley, are frequently used in everyday conversation. Such intermediate linguistic art is interesting in that it retains much of the neatness of poetry without sacrificing the natural vigor of popular spoken language. This paper is the first, to my knowledge, to apply this data to the interface between syntax and phonology.

The following discussion is concerned with essentially five theoretical issues: 1) what kind of metrical/prosodic structure the lyrics have, 2) how grammatical factors affect alignment of syllables to beats, 3) to what extent syntactic constituents interact with metrical constituents, 4) what domain the principles governing the lyric rhythm are sensitive to, and 5) how alternative metrical patterns are selected in oral performances with different tempos.

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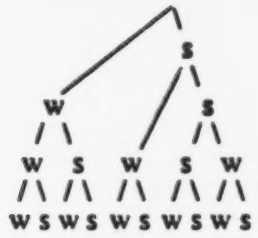
Kansas Working Papers in Linguistics, 1991, Volume 16, pp. 77-98

Metrical Structure and Prosodic Constituent Structure

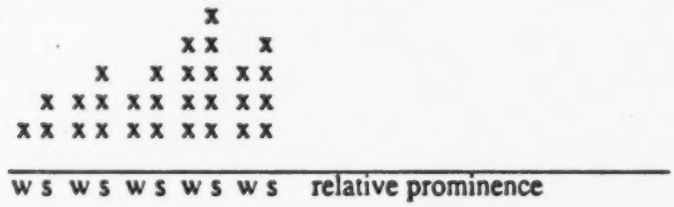
Broadly speaking, two major approaches to metrical structure have been pursued. On the one hand, Kiparsky (1977,1979) and Giegerich (1983,1984,1985), and those following their lead, propose that the metrical structure of English is fundamentally binary. The formal device used to capture this insight is the metrical tree, which consists of binary branching nodes labeled for relative prominence, i.e., strong (s) and weak (w), as illustrated by the following representation of iambic pentameter:

(1)



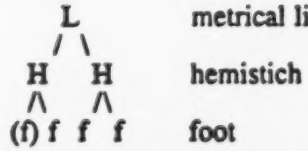
On the other hand, the metrical grid, introduced by Liberman & Prince (1977), and elaborated in various ways by Prince (1983), Hayes (1983, 1984), and Selkirk (1984), makes it possible to represent relative metrical prominence without trees. The representation of iambic pentameter in (1) can be reformulated as a grid, as in (2):

(2)



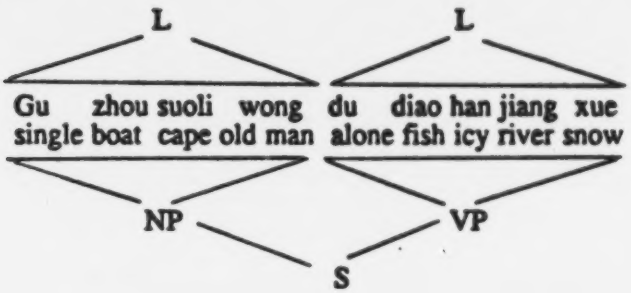
Chen (1979,1980,1984b) argues based on evidence from Chinese regulated verse that both hierarchical and binary metrical trees are needed to account for the various metrical patterns in this language. He proposes the metrical structure in (3), which yields the two kinds of regulated verse that exist in classical Chinese poetry: the five-syllable pattern if the parenthesized (f) is omitted, and the seven-syllable pattern otherwise.

(3)



This structure can be viewed as a metrical prototype for Chinese regulated verse (cf. also Yip 1980; Xue 1989). This sort of metrical line frequently coincides with a syntactic constituent (a phrase, a clause, or a sentence). It is therefore often found that two or more metrical lines may form a larger syntactic constituent -- the S in (4), for example.

(4) 'An old man with a bamboo-leaved cape in a boat is fishing the snow in the icy river.'



A line of the Taiwanese folk song lyrics is frequently formed by the combination of such Ls, i.e., an individual line may contain a sequence of structures like (3). Generally speaking, these folk songs lyrics have the metrical properties of two major sources from which they derive, i.e., the classical regulated verse and irregular-length verse. A very interesting rhythmic tendency of the lyrics observed here is that claps usually fall on foot-initial beats, and that renders a kind of trochaic meter. The relative prominance of the syllables within a foot will therefore be indicated by beats specified with *s* (+ clap) and *w* (- clap). In order to capture the generalization concerning the prototypical rhythmic organization of such lyrics, I propose the following metrical structure, or more precisely, prosodic constituent structure (PCS).

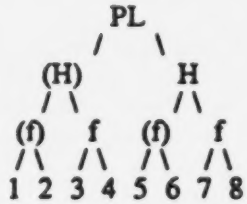
(5)

lyric line

prosodic line

A prosodic constituent structure, to use Selkirk's (1984) term, includes metrical trees like (3). A lyric line (LL) is formed from one or more prosodic lines (what Chen refers to as metrical lines). The metrical structure in (3) can now be re-labeled and modified for language-typological purposes, as shown by the PCS in (6).

(6)



prosodic line

hemistich

foot

prosodic template

---

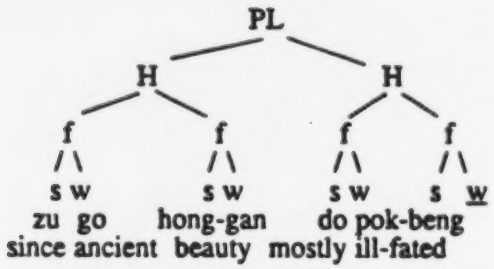
s w s w s w s w feminine metrical pattern
s w s w s w s w masculine metrical pattern

(6) shows that a prosodic line (PL) consists of one or two hemistiches (half-PLs). A hemistich (H) consists of one or two feet (f). Beats on the prosodic template (the numerals labeled with s/w) form trochaic feet. The parentheses in this PSC indicate the possible absence of constituents. Beats are generally aligned with syllables, in

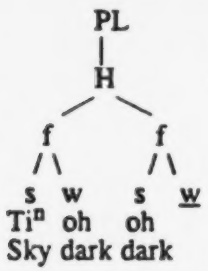
which case they can be thought of as audible beats. However, the beat in PL-final position may fail to be aligned with a syllable, i.e., may be a silent beat (w).

A PL must conform to one of two metrical patterns (MPs), i.e., it may contain an odd number of audible beats and end in a silent beat (the masculine MP), or it may contain an even number of audible beats and end in a weak audible beat (the feminine MP). In other words, the audible beat in PL-final position may either be strong (s) or weak (w). The following examples illustrate the various MPs that (6) sanctions.[2]

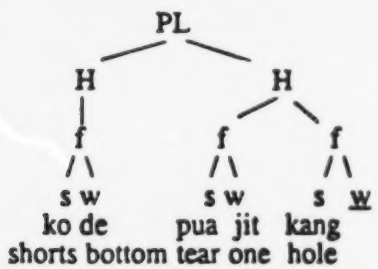
(7) 'Since the ancient time, beautiful girls are usually ill-fated.' (Taiwan Mingyao 1987: 89)



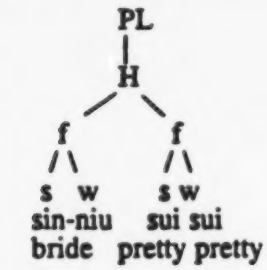
(8) 'The sky is dark.' (Taiwan Minyao 1987: 42)



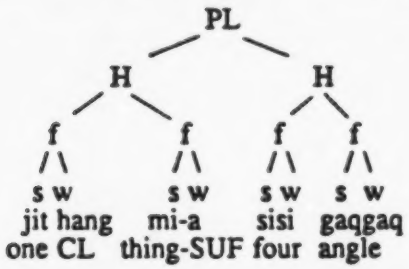
(9) 'In the bottom of the shorts a hole is torn.' (Taiwan Minyao 1987: 191)



(10) 'The bride is pretty.' (Taiwan Minyao 1987: 192)



(11) 'Something square.' (Taiwan Minyao 1987: 201)

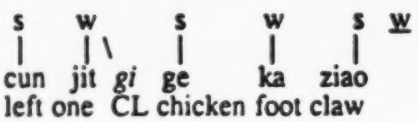


(7), (8) and (9) are instances of masculine MPs, and (10) and (11) of feminine MPs. These examples show that each PL may have as few as three audible beats, or as many as eight audible basic beats. Poetic convention dictates that the number of audible beats always matches the number of syllables. That is, every syllable is aligned with a single beat.

Lexical Syllables Versus Functor Syllables

In contrast to the classical regulated verse and irregular-length verse, Taiwanese folk song lyrics have the charming property of allowing a mismatch between the number of audible beats and the number of syllables in a PL. I will call a mismatch of this type a **syllable-beat mismatch**. To be specific, there may be fewer audible beats than syllables. In that event, the discrepancy between lexical syllables and functor syllables plays a crucial role in determining syllable-to-beat alignment. For example, given a PL with five audible beats but six syllables, an improper alignment of syllables to beats results in an unmetrical rhythm, as can be seen in (12) and (13).

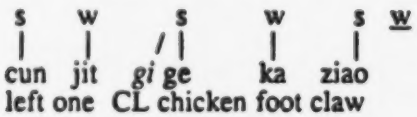
(12) 'A chicken claw is left.' (Taiwan Minyao 1987: 182)



(13)* 'A chicken claw is left.'

When a PL has a masculine MP, the PSC in (6) guarantees that this PL ends in a silent beat. Consequently, in PLs like (12) and (13) two syllables must share a beat. In this case, phonological facts alone are insufficient to determine which two, i.e., to obtain (12) and exclude (13). Syntactic information is crucial here. The key to understanding the contrast between (12) and (13) is the way in which beats are aligned with **functors**, i.e., words and morphemes with primarily grammatical import. Following general criteria for classifying elements as functors outlined in Bolinger (1975) and Crystal (1980) as well as specific criteria for Taiwanese (Cheng 1989b) and other Chinese dialects (Lu 1985, Pan 1989 and Hsiao 1990b,1991b), I assume that the class of functors in Taiwanese includes classifiers, prepositions, auxiliaries, complementizers, conjunctions, pronouns, and structure markers. Syllables which are not functors are called here **lexical syllables**. A tentative principle governing the alignment of functor syllables is as follows. Given two pairs of adjacent syllables, the pair including a functor more felicitously forms a beat; however, this is not to say that a functor may pair off with any adjacent syllable:

(13)* 'A chicken claw is left.'



Contrasting with (12), in which *gi* adjoins to the left-adjacent beat, in (14) it adjoins to the right-adjacent beat, yielding an unmetrical rhythm. It is clear then that the adjunction of a functor syllable can only go one way, i.e., to the left. The tacit assumption here is that functors are not originally aligned with a beat. Only lexical syllables are always aligned with a beat. When there is a syllable-beat mismatch, functor syllables are aligned or adjoined to beats according to certain principles. Consider, for instance, (7-11). The number of beats matches the number of syllables, i.e., there are five syllables for a five-audible-beat MP. As a result, every syllable -- regardless of its syntactic status -- is aligned with a single beat. The PLs in (13) and (14), on the other hand, pose a problem, as we have seen, since there is a syllable-beat mismatch. What we need is a set of well-formedness principles that predict the correct output both in cases like (7-11) and in cases like (12). The first three of the principles that I propose for syllable-to-beat alignment -- hereafter, called **Rhythm Principles** (RPs) -- are given in (15).

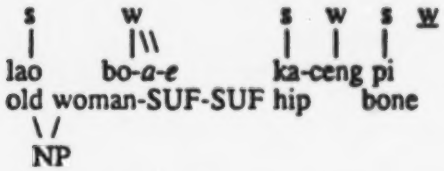
(15) One-to-One Alignment Principle (OAP): Every syllable is aligned with a beat, iff the number of audible beats matches the number of syllables.

(16) Lexical Syllable Principle (LSP): Only lexical syllables are aligned with a beat, if there is a syllable-beat mismatch.

(17) Stray Syllable Principle (SSP): A stray syllable is aligned or adjoined to a left-adjacent beat.

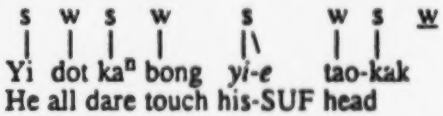
Given the LSP, "stray syllable" in the SSP usually means functor. In the lyrics, lexical syllables are more prominent than functor syllables, since only the former are truly crucial to conveying the meaning. These principles give lexical syllables priority in the beat aligned processes. The principles in (15-17) correctly allow for the possibility of a structure in which a beat is adjoined to by more than one stray syllable. For example, the two stray syllables in (18) share a beat with po, in conformance with the SSP.

(18) 'The old woman's hipbone.' (taiwan Mingyao 1987: 186)



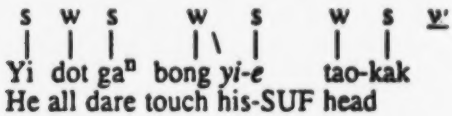
Both -a and -e are functor syllables and thus are subject to the SSP.[3] However, functor syllables may behave differently when they audible beats sanctioned by a certain MP outnumber the lexical syllables. (19), for example, is not predicted by the RPs in (15).

(19) 'He still dares to touch his head.' (Taiwan Mingyao 1987: 201)



The SSP does not require that yi and -e must share a beat. An unmetrical alignment like (20) cannot therefore be prevented.

(19) 'He still dares to touch his head.'



If -e is the one aligned with the beat, yi would undesirably share a beat with bong. What this shows is that a functor-suffix like -e is the last element to be aligned to a single beat. In order to account for the existence of structures like (19), a principle such as (21) is required.

(21) Functor Syllable Principle (FSP): Functor syllables which are not suffixes are aligned with a beat, iff the audible beats outnumber the lexical syllables.

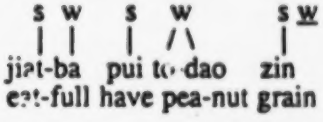
Given the FSP, the pronoun 伊 but not the suffix 的 is aligned to the extra beat; 的 then correctly adjoins to the left-adjacent beat (by the SSP).

One possible motivation for the FSP is that functor-suffixes in this language are semantically less contentful than other functors. The Taiwanese genitive 的, for example, carries as little semantic content as the English possessive 's. Cheng (1989b) defines functor-suffixes like 的 as structure markers, and indicates that they always correspond to neutral tones (weak beats), while other types of functor syllables or suffixes surface with such tones only on more limited occasions.

The Interaction of Syntax and Phonology

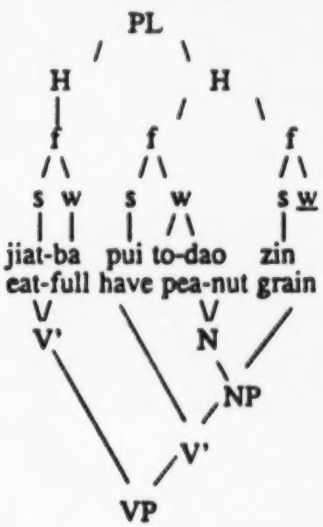
So far, we have focused on beat alignment in cases where the distinction between lexical syllables and functor syllables plays a role. A question still remains as to what happens when there is a syllable-beat mismatch and all the syllables are lexical syllables. In what follows, I will show that, in cases like this, the alignment process is directly influenced by syntactic constituency. Consider, for example, (22). The PL consists of five audible beats but six syllables, including no functor syllable.

(22) '(He) has peanuts after the meal.' (Taiwan Minyao 1987: 192)



The beat alignment in (22) is neither accounted for by the principles in (15) nor by that in (21), since there is no functor syllable involved. Yet there is a mismatch between syllables and audible beats. Based solely on phonological information, we have no way to tell which is a stray syllable if any. It is therefore necessary to look at the syntactic structure. Consider the prosodic and syntactic constituents of (22):

(23) '(He) has peanuts after the meal.'



The two syllables forming a beat in (23), *to* and *dao*, are immediate constituents (ICs) of the syntactic node N. Let us assume that rather than being aligned to a particular syllable, the beat in (23) is aligned to the syntactic constituent N. The following principle must therefore be added to those in (15) and (21).

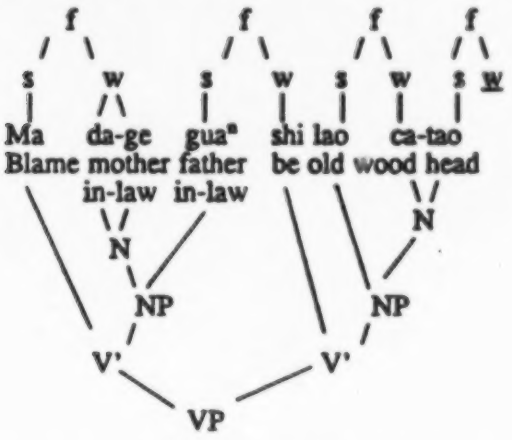
(24) Immediate Constituent Principle (ICP). Syntactic immediate constituents form a polysyllabic beat if a syllable-beat mismatch is thereby resolved.

(24) predicts that there might be alternative ways of resolving a syllable-beat mismatch in a line like (23), the two syllables *jiat* and *ba* are ICs of V', and thus should be able to form a disyllabic beat. This prediction is borne out, as shown by (25), an alternative -- though less frequently heard -- rhythm for (23).

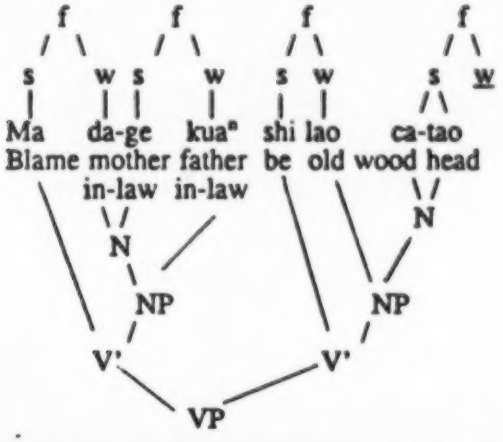
(25) '(He) has peanuts after the meal.'

It should be mentioned that the alignment of syntactic nodes with beats is required only when it is needed to resolve a syllable-beat mismatch. That is to say, in cases like (23) and (25), the five-audible-beat MP does not require both the first V' node and the first N node to be aligned with beats, nor does it allow the NP, the second V' or the VP to form a polysyllabic beat, since another syllable-beat mismatch would thereby be created. Consider now (26) and (27).

(26) 'Insult the in-laws and call them boneheads.'
(Taiwan Minyao 1987: 240)



(27)* 'Insult the in-laws and call them boneheads.'



The fact that the ICs of the first N rather than those of the second N in (26) must share a beat cannot be explained by syntactic constituency alone. Other factors may play a role. The distinction between *da ge* and *ca tao* is that *tao* is aligned to the PL-final audible beat but *ge* is not. What this tells us is that the final audible beat in a PL cannot be divided. That is, it cannot be aligned with more than one syllable. In the case of (26), it must be aligned with *tao* only, and thus the first N but not the second N is aligned with a beat. The ICP then needs to be supplemented by the principle in (29).

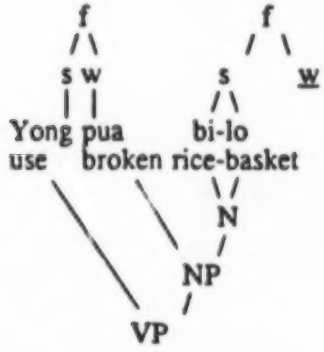
(28) FAI (Final Audible-Beat Indivisibility): A ML-final audible beat is indivisible.

(29) FSA (Final Syllable Alignment): When the ICA conflicts with the FIB, only the final syllable in the relevant ML can be aligned with the ML-final beat.

(27) is prohibited by the FAI. The fact that a final audible beat is indivisible forces it to correspond only to the final (rightmost) syllable. In (26), the second N is subject to the ICP, which, however, is in conflict with the FAI. The FSA then dictates that only *tao* be aligned to the final audible beat. The penultimate syllable *ca* is aligned to a separate beat. As predicted by (28) and (29), the final audible beat remains indivisible even in cases where the penultimate syllable must share a beat with a left-adjacent syllable, as in the following examples.

(30) 'Use a broken rice basket.' (Taiwan Minyao, 1987: 187)

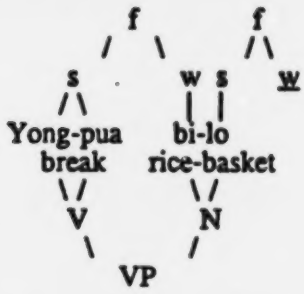
(31)* 'Use a broken rice basket.'



Since *bi* in (30) cannot be aligned to the final audible beat, it becomes a stray syllable and thus shares a beat with *pua*, in accordance with the SSP (Stray Syllable Principle).

Based purely on metrical considerations, one might conclude from (32) that examples like (30) can have an alternative metrical alignment. However, if we consider the syntactic difference between (30) and (32), we find that not only would this conclusion be erroneous, but that the validity of the ICP, the FAI and the FSA is further supported by such examples.

(32) 'Breaks a rice basket.'

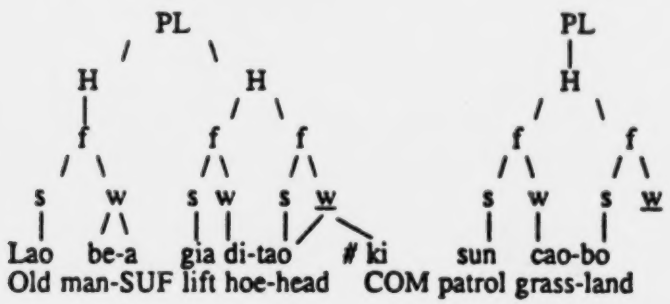


Unlike in (30), *pua* in (32) is an element in a verbal compound. Therefore there are two pairs of ICs forming disyllabic beats in (32): V and N. Both are subject to the ICP, but the FAI and the FSA insure that *bi* and *lo* are not aligned with the same beat. *Yong* and *pua* then share a beat by the ICP. The contrast between (30) and (32) shows again that different syntactic structures may correlate with different metrical patterns.

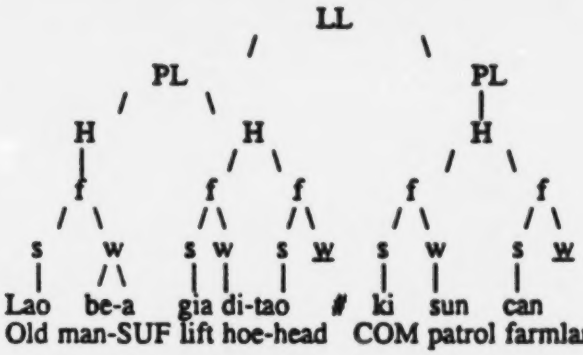
The Domain for the Rhythm Principles

The application of the RPs (Rhythm Principles) depends on whether there is a syllable-beat mismatch in a certain prosodic domain, which so far has been a PL. The question that arises then is how the RPs apply when there are two or more adjacent PLs involved. Could those principles be sensitive to the domain of LL? The contrast between (33) and (34) shows that the answer is negative.

(33) 'The old man carries a hoe to patrol the meadow.'
(Taiwan Minyao 1987: 183)

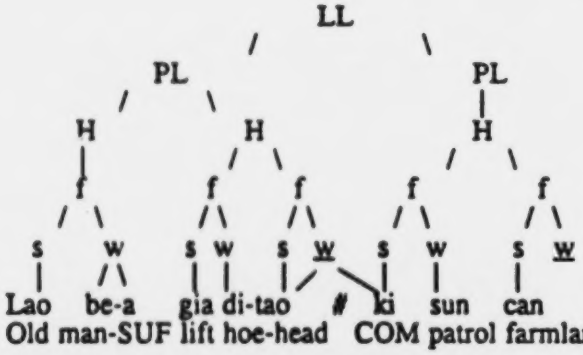


(34) 'The old man carries a hoe to patrol the farmland.' (adjusted from 33)



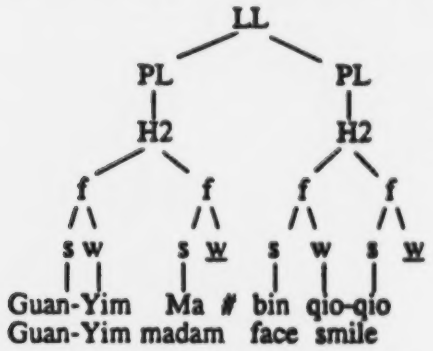
In (33), a PL with a five-audible-beat MP is followed by one with a three-audible-beat MP. The symbol "#" indicates the PL boundary. Both PLs are subject to the SSP, as the functor-suffix *-a* in the first PL joins with *be* to form a beat and ki in the second PL adjoins to the left-adjacent silent beat (w). Notice that *ki* only takes half of the silent beat, i.e., 0.5n msec in terms of relative time value. The other half of the silent beat (or *0.5n* msec) goes to the syllable-lengthening of *tao*. When *cao-bo* in (33) is replaced by *can*, as in (34), the functor syllable ki is no longer adjoined to the left-adjacent silent beat, because the second PL has no syllable-beat mismatch and thus is subject to the OAP (One-To-One Alignment Principle), which requires every syllable to be aligned with a beat. If the domain for the RPs is the LL, a syllable-beat mismatch would occur. There would be nine syllables but only eight audible beats in the whole LL, in which case the unmetrical (35) would be sanctioned.

(35)* 'The old man carries a hoe to patrol the farmland.'

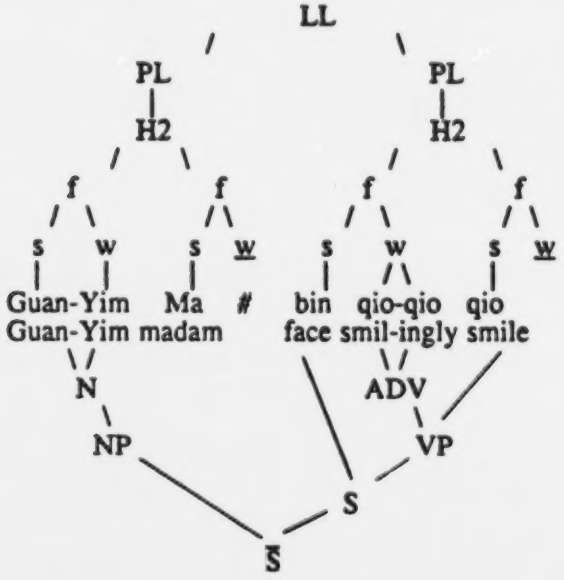


The undesirable beat alignment in (35) would not occur if the syllable-beat symmetry were recognized in the PL. Another example that supports the claim that the RPs are not sensitive to the LL domain is shown in (37), which is identical to (36) except that a third *qio* is added.

(36) 'Bodhisattva Guan-Yim smiles.' (Taiwan Minyao 1987: 190)

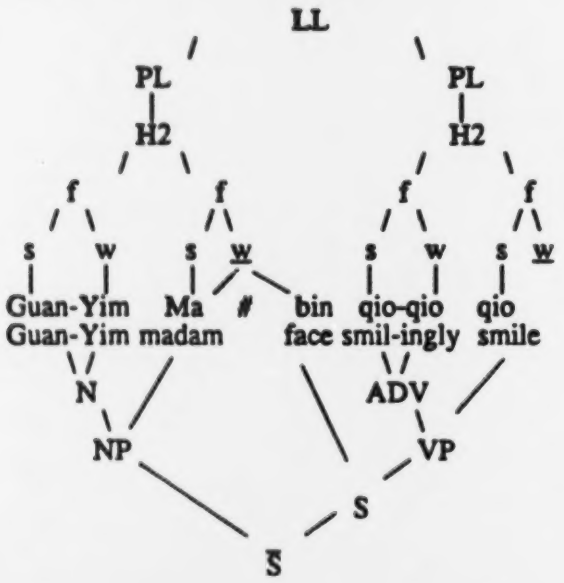


(37) 'Bodhisattva Guan-Yim smilingly smiles.' (adjusted from 36)



In (37), the ADV node is aligned with a single beat, since the fact that its two syllables are ICs makes it subject to the ICP (Immediate Constituent Principle). If this principle applies to the LL domain, we might expect that not only the ADV but the N (*Guan-Yim*) would be aligned with a beat, since the syllable-beat symmetry in the first PL does not exist at the LL level. Conversely, if the ICP would not be invoked, no alignment of syntactic nodes would occur. The situation would be "all or nothing." Either way, (37) would not be derived. Consider now (38).

(37) 'Bodhisattva Guan-Yim smilingly smiles.'



Bin in (38) is left-adjoined to the silent beat as *ki* is in (33). The catch, however, is that *bin* is a lexical syllable. Recall that bi in (30), also a lexical syllable, is adjoined to the left-adjacent beat due to the fact that the IP (Indivisibility Principle) makes it a stray syllable. *Bin* in (38), in contrast, is not subject to either of the principles, i.e., it is not a stray syllable but adjoins to the left-adjacent silent beat. Therefore, a further principle is needed to account for this phenomenon.

(39) Silent Beat Principle (SBP): A syllable is adjoined to a left-adjacent silent beat, iff the ICP does not apply as expected or fails to resolve a syllable-beat mismatch.

This principle insures that a syllable may only be adjoined to a left-adjacent silent beat that is functionally aligned, i.e., the case in which we get syllable-lengthening. The syllable, thus, can only partly adjoin to the silent beat and cannot be aligned to the whole beat. If a silent beat is not functionally aligned, it would necessarily be a pause, i.e., a beat that is not aligned in any way (cf. Selkirk 1984). If a syllable were adjoined to a silent beat of this kind, it would be aligned with the whole beat (i.e., it would take *n* msec rather than *0.5n* msec) -- an unmetrical result. In short, when the SBP applies, there is no pause. Notice that if the application of the ICP ends up resolving a syllable-beat mismatch, the SBP is no longer needed, as shown in (37). Conversely, (38) exemplifies an equally acceptable alternative when the SBP instead of the ICP is invoked in structures like (37). It should be noted that in cases like this, the ICP can be spared only if the SBP can sanction an acceptable alternative.

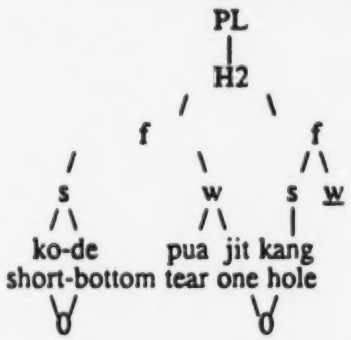
Selection of Metrical Patterns

The Rhythm Principles (RPs) constrain syllable-to-beat alignment based on a selected metrical pattern (MP) which is taken as a given. That is to say, the number

of beats in a PL are pre-determined before those principles apply. What has not been mentioned is how the native speaker knows that a certain number of beats go with a certain PL, i.e., how a particular MP is selected. In the lyrics of Taiwanese folk songs, this sort of selection is quite robust and context-free. A very simple criterion for MP selection is that the audible beats cannot outnumber the syllables.

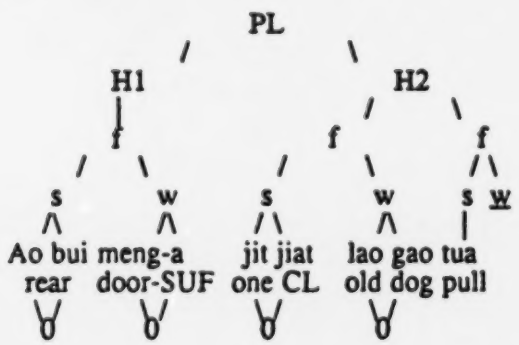
Since the RPs condition the well-formedness of the lyrics, a selected MP must also conform to those principles in terms of beat alignment. For example, a pentasyllabic PL may select a masculine MP with five audible beats, in accordance with the OAP (One-To-One Alignment Principle). However, other principles may allow it to select a MP with fewer audible beats, as in (40).

(40) 'In the bottom of the shorts a hole is torn.' (Taiwan Minyao 1987: 191)



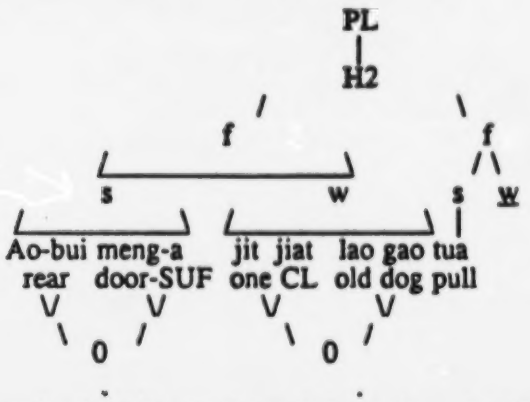
The MP in (40) has only three audible beats, and it is selected because the beat alignment can be accounted for by the RPs. The ICP (Immediate Constituent Principle) aligns the first but not the second circled syntactic node to a beat, for the first part of the IP (Indivisibility Principle) prohibits the final audible beat from being divided. To resolve this conflict, the second part of the IP dictates that only *kang* is aligned to the final audible beat. *Jit* is then adjoined to the left-adjacent beat by the SSP (Stray Syllable Principle). It is important to note that if not for the final audible beat, the prosodic constituents (beats) would match the syntactic constituents (the circled nodes) perfectly. (41) demonstrates a clear case of such a match.

(41) 'At the rear door, an old dog is pulling (it).' (Taiwan Minyao 1987: 185)



The four circled nodes in (41) match the first four beats so that the nine-syllable PL can select a five-audible-beat MP, conforming to the ICP.[4] In effect, this principle also predicts further matches of beats with higher syntactic nodes, as in (42).

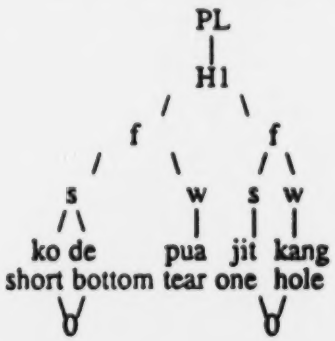
(42) 'At the rear door, an old dog is pulling (it).'



The two circled nodes in (42) are formed from those in (41). As predicted by the ICP, both circled nodes in (42) are aligned with beats. This allows for the nine-syllable PL to select even a three-audible-beat MP. It is clear then that alternative MPs can be selected for the same PL, provided that they comply with the Rhythm Principles. The choice of MP in such cases is influenced by the tempo used. (41) is appropriate for a relatively fast tempo; (42) for an even faster one. The same LL would select a nine-audible-beat MP in a regular tempo.

A final remark concerning MP selection is that masculine MPs are usually preferred over feminine ones. This may explain why (40) is much more often heard than (43).

(43) 'In the bottom of the shorts a hole is torn.'



The principles for metrical pattern selection may now be listed as follows:

(44) The audible beat cannot outnumber the syllables.

(45) A MP cannot be selected if it would result in beat alignments violating the RPs.

(46) When all requirements are met, a masculine MP is preferred over a feminine MP.

Concluding Remarks

To sum up, there are two facets to the lyric rhythm of Taiwanese folk songs, i.e., beat alignment and MP (metrical pattern) selection. Due to the fact that the folk song lyrics are metrically derived from classical Chinese verse, a PL (prosodic line) may display a syllable-beat symmetry. A common phenomenon in the folk song lyrics, however, is the existence of syllable-beat mismatches. Lexical syllables have priority over functor syllables when it comes to beat alignment in such mismatches. In all likelihood, this tendency appears to be language universal. For example, analyzing the linguistic rhythm in English, Liberman & Prince (1977) and Hayes (1983) also indicate that lexical syllables are always grid-marked.

Functor syllables, on the other hand, tend to be left-adjoined to the relatively weak positions in the trochaic meter. There is some cross-linguistic evidence for this kind of intuitively clear distinction between lexical and functor syllables. Pan (1989) shows that in the Wunzhou dialect of Chinese, the closed class of words (functor syllables) tends to surface with neutral tones, which in Chinese dialects correspond to weak beats. Hung (1987) comes to the same conclusion in his treatment of the Mandarin functor-suffixes. Our findings in Taiwanese reinforce the assumption that the prominence of lexical syllables over functor syllables is pan-dialectal in Chinese.

In the lyrics of Taiwanese folk songs, beat alignment and MP selection, in fact, can be thought of as a result of matching phonological and syntactic constituents, e.g., the beats with the circled nodes in (38), the PLs/MPs with the NP and the VP in (35-40) and the like. The domain of PL always coincides with a syntactic constituent, within which the RPs operate. In addition to the grammatical distinction between lexical and functor syllables, the RPs are also sensitive to syntactic immediate constituency, suggesting that direct interaction exists between the phonological and syntactic constituents, as the ICs may form polysyllabic beats in the lyrics. Similar evidence from Mandarin verse is presented by Chen (1984b,c) and Shih (1986.1990), where immediate constituency plays an analogous role in foot formation.

It is worthwhile to note that whereas the Taiwanese Rhythm Principles are sensitive to IC hierarchy, the tone sandhi rules in this dialect completely ignore it. Instead, they apply to tone groups formed by maximal projections (cf. Chen 1987,1989; Hsiao 1990a,1991a). Shih (1986) also argues that Mandarin tone sandhi applies cyclically only on prosodic constituents (prosodic foot, et cetera), implying that it is oblivious to syntactic ICs. Given that tone sandhi and metrical rhythm behave differently in both Taiwanese, a southern dialect, and Mandarin, a northern dialect, it would not be surprising to find that this sort of divergence is widespread among Chinese dialects.

NOTES

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1. Taiwanese is a Chinese Southern Min dialect spoken in Taiwan and on neighboring islands. When this dialect is spoken elsewhere, it is called by various names, e.g., Amoy, Hokkian, Xiamen and so on. In spite of slight differences, those regional variants are close enough to be considered a single dialect. (For introduction of this Chinese dialect, cf. R. Cheng & S. Cheng 1982; J. Huang 1985; R. Cheng & S Huang, eds; Cheng 1989a,b; J. Hsu 1989).

2. The suffix *-a* is an emphatic marker and the suffix *-e* is a genitive marker.

3. *Meng-a* and *jit jiat* can also be accounted for by the SSP (Stray Syllable Principle); *-a* is a functor syllable suffix and *jiat* is a classifier.

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